United States Patent

[11] 3,563,239

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Continuation-in-part of application Ser. No. 503,874, Oct. 23, 1965, now Patent No. 3,399,675, dated Sept. 3, 1968.

[54] **HYPODERMIC INJECTOR**
1 Claim, 6 Drawing Figs.

[52] **U.S. Cl.** **128/215,** 128/303.1
[51] **Int. Cl.** **A61m 5/18,** A61b 17/36
[50] **Field of Search** 128/215, 218, 218.2

[56] **References Cited**

UNITED STATES PATENTS

1,991,103	2/1935	King	128/218.2
2,664,086	12/1953	Transue	128/218.2
2,674,246	4/1954	Bower	128/215
2,804,074	8/1957	Hill	128/218.2

FOREIGN PATENTS

436,971	6/1948	Italy	128/218.2
1,076,898	3/1960	Germany	128/218.2

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ABSTRACT: Chilling device for a hypodermic needle comprising a casing of heat absorptive material having sufficiently thick walls to be refrigerated and thereby act as a pain killer for the injections.

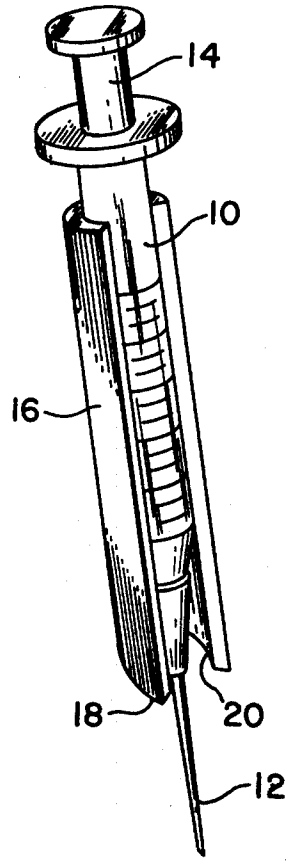


FIG. 1

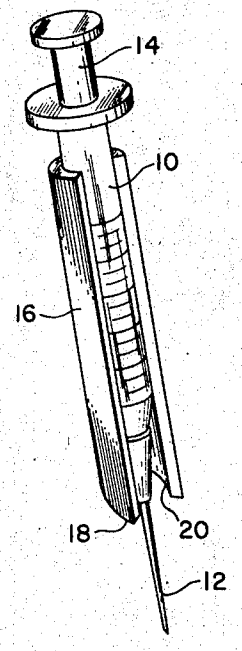


FIG. 2

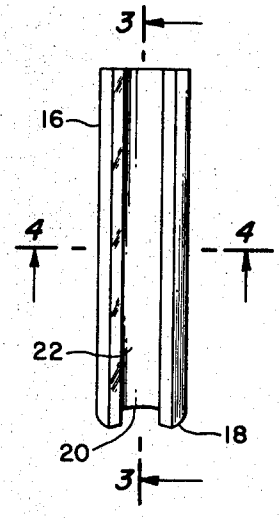
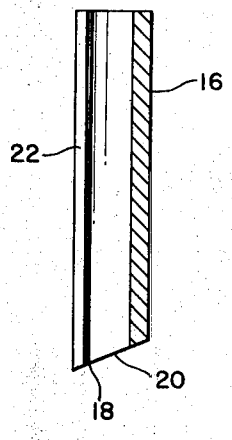


FIG. 3



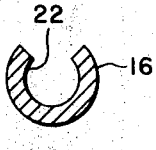


FIG. 4

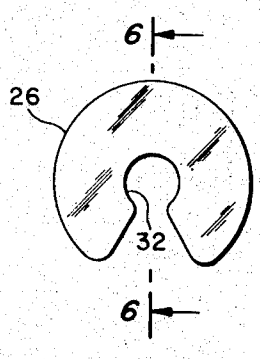
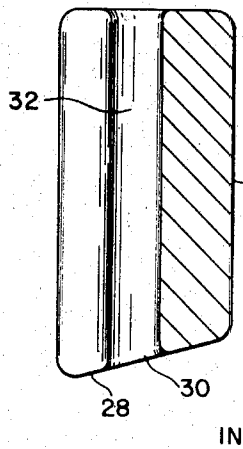


FIG. 5

FIG. 6



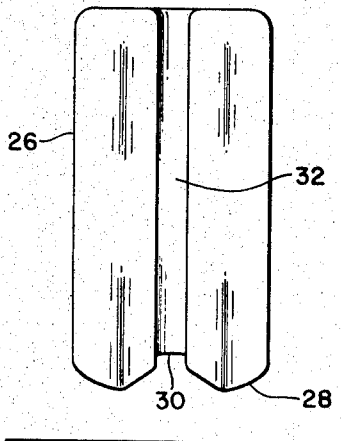


FIG. 7

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HYPODERMIC INJECTOR

CROSS REFERENCE

This application is in part a continuation of my copending application Ser. No. 503,874 filed Oct. 23, 1965, now U.S. Pat. No. 3,399,675, Sept. 3, 1968, of the same title.

BACKGROUND

This invention relates to hypodermic injectors, and more particularly, to such devices used with hypodermic syringes and hypodermic needles.

Prior to the present invention, there has been a long existing need for a means to minimize the discomfort resulting from injection of a hypodermic needle into the body of a patient. This need has been particularly important for the many patients, such as diabetics, who wish to or must self-administer the required medicaments, such as insulin, by means of a hypodermic. Some diabetics, for example, refuse to take or delay taking the prescribed dosage of insulin for fear of the pain or discomfort resulting from injection of a hypodermic needle into the body.

PRIOR ART

King U.S. Pat. No. 1,991,103 has a contact fork of too small cross section for effective chilling, and has many complicated parts.

Transue U.S. Pat. No. 2,664,086 has a contact sleeve too thin for effective chilling, and also has many parts.

The main object of the present invention is to minimize the pain or discomfort resulting from the injection of a hypodermic needle into the body of a patient.

Other objects are to provide a hypodermic syringe injector which is safe to use and is easily used by anyone regardless of mechanical aptitude, and to provide an inexpensive hypodermic syringe injector which can be manufactured with inexpensive tooling.

SUMMARY

According to applicant's invention a guide is provided for the barrel of a medical syringe having a hypodermic needle, the guide having an abutment to engage a patient with an aperture for said needle and a window for the barrel scale, the guide being constructed of heat absorptive material capable of being chilled, said aperture being small enough to bring the abutment sufficiently close to said needle, and said abutment being of sufficient mass to materially desensitize the area contacted by said abutment against the pain of said needle.

Preferably the guide contains aluminum and is of greater mass than that needed for structural purposes, with a cross-sectional area greater than half of said barrel. Preferably the guide is a thick walled tube having a groove forming a socket for the barrel and the window for the scale.

Preferably the abutment is formed by the angularly disposed forward end of the tube, which constitutes the needle receiving aperture. The tube is preferably of a length substantially coextensive with the scale of said barrel, and the tube has a wall of substantially constant cross section throughout such common length. The guide preferably has an internal diameter to receive the barrel, and an outside diameter between five-eighths of an inch and 2 inches. Preferable, the outside diameter is about 1 inch, and the guide is of one piece integral construction.

DRAWINGS

FIG. 1 is a perspective view of one embodiment of the invention, as employing a medical syringe and a hypodermic needle;

FIG. 2 is a front elevation of FIG. 1, with the syringe and needle removed;

FIG. 3 is a vertical section taken along the line 3–3 of FIG. 2;

FIG. 4 is a transverse section taken along the line 4–4 of FIG. 2;

FIG. 5 is a plan view of a modification;

FIG. 6 is a vertical section taken along the line 6–6 of FIG. 5; and

FIG. 7 is a front elevation of the structure shown in FIGS. 5 and 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The injector is shown in the drawings as applied to a hypodermic syringe having a barrel **10**, a needle **12**, and a plunger **14**. The injector comprises a guide **16** for the barrel **10**, and abutment **18** to engage to body of a patient. The abutment has an aperture **20** for passage therethrough of the needle **12**, as the barrel travels along the guide **16**. The guide **16** and the abutment **18** are constructed of heat absorptive material of sufficient mass to materially desensitize the area contacted by the abutment **18** against the pain of the needle **12**.

In the form shown in FIGS. **1** to **4**, the guide **16** is preferably a thick-walled tube of aluminum, having a groove **22** receiving the barrel **10**, and forming an observation window for the scale of the syringe. The end of this tube forms the abutment **18**, and the end of the groove **22** forms the needle aperture **20**.

In operation, the abutment **18** or preferably the entire injector is cooled below ambient temperature by being placed in a refrigerator or freezer or by other suitable means. The injector is then placed on the patient at the desired injection site with the patient contacting abutment engaging the body of the patient. The patient then grasps the filled and sterilized syringe, preferably at the flange and/or the adjacent principal outside diameter of the barrel **10**, and inserts the barrel **10**, with the needle **12** thereon, on through the inside diameter of the guide **16** until the needle **12** is inserted into the body of the patient to the desired depth.

There is a reduction of pain when the needle is inserted into the body of the patient due to the cooling effect of the injector. The groove **22** forms an observation window which permits the patient to observe the syringe scale and other parts of the syringe, thus the injection of the medicament and withdrawal of the needle may then be made in the normal manner.

The principal outside diameter of the syringe barrel **10** is only slightly smaller than the inside diameter of the guide **16**. This results in reasonably straight line motion of the needle **12** as it is being inserted into the body of the patient, which minimizes the discomfort associated with the insertion of the needle **12** as compared to the hooked motion which frequently results from manual insertion of the needle without the aid of an injector. In order to provide reasonably straight line motion, the length of the guide **16** should be more than half the length of the syringe barrel.

Another advantage of the guide **16** is that the fear by the patient is alleviated, and less courage is needed to insert the needle **12** into the body of the patient when using the guide **16** than without it. If the guide **16** is cooled by being placed in a freezer, it should be covered with aluminum foil or other food wrapping material to prevent frost accumulation.

In the form shown in FIGS. **5**, **6**, and **7** the guide **26** has an abutment **28** to engage the body of a patient. The abutment has an aperture **30** for passage therethrough of the needle **12**, as the barrel travels along the guide **26**.

The guide **26** has a groove **32** to receive the barrel **10** and forming an observation window for the scale of the syringe. The end of this tube forms the abutment **28**, and the end of the groove **32** forms the needle aperture **30**.

The length of the groove **32**, the diameter of the aperture **30**, and the angle of the abutment **28** are the same as those dimensions of the corresponding groove **22**, aperture **20** and abutment **18** of the form shown in FIGS. **1** to **4**. However, the outer diameter of the guide **26** and the wall thickness outside of the groove **32**, are considerably larger than of the outer diameter of the guide **16**, and the wall thickness outside of the groove **22**, in the form shown in FIGS. **1** to **4**.

The inner diameter of the grooves **22** and **32** is about three-eighths of an inch. The outer diameter of the guide **16** is about five-eighths of an inch, and the guide could be made of sheet aluminum or alloy thereof about one-eighth of an inch thick, for a 1 cubic centimeter insulin hypodermic syringe.

The outer diameter of the guide **26** may be as much as 2 inches and may be made of cast aluminum or alloy thereof, although an outer diameter of 1 inch may be preferred. Thus the range of outer diameters for the guides **16** and **26** is from five-eighths of an inch to 2 inches.

I claim:

1. Injector for a syringe having a barrel with a scale and a hypodermic needle for injecting a patient:

said injector comprising a guide for said barrel to provide rectilinear movement of said needle;

said guide having an abutment to engage the body of a patient;

said abutment having an aperture for passage therethrough of said needle as said barrel moves along said guide;

said guide having a window through which the scale of said barrel is visible;

said guide being constructed of metal having an internal diameter about three-eighths of an inch, an outside diameter of about 1 inch, and capable of being chilled below ambient temperature by being placed in a refrigerator, and the abutment then placed on the patient while still at said lower temperature;

said aperture being not materially larger than said barrel to leave said abutment sufficiently close to said needle; and

said abutment being of sufficient mass and thermal conductivity to materially desensitize the area contacted by said abutment against the pain of said needle.